Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Solution by G. W. GREENWOOD, M. A., McKendree College. Lebanon, Ill.

Denote the equation of one ellipse by $x^2/a^2+y^2/b^2=1$. The quadrilateral circumscribing both is evidently a rectangle whose sides are respectively parallel to the common chords. Their equations are, therefore,

$$x\cos\tfrac{1}{2}\theta+y\sin\tfrac{1}{2}\theta=P_1\,;\quad -x\sin\tfrac{1}{2}\theta+y\cos\tfrac{1}{2}\theta=P_2\,;\quad \text{where}\quad P_2^2=a^2\cos^2\tfrac{1}{2}\theta+b^2\sin^2\tfrac{1}{2}\theta\,;$$
$$P_2^2=a^2\sin^2\tfrac{1}{2}\theta+b^2\cos^2\tfrac{1}{2}\theta.$$

The required area $=4P_1P_2=4\sqrt{[(a^2-b^2)\sin^2\tfrac{1}{2}\theta\cos^2\tfrac{1}{2}\theta+a^2b^2]}$.

Also solved by A. H. Holmes, A. S. Hawkesworth, and G. B. M. Zerr.

272. Proposed by R. D. CARMICHAEL, Hartselle, Ala.

A point A revolves with uniform speed in a circle. A point B revolves around A, at a uniform distance from it, with the same angular velocity, but in the opposite direction. Determine the locus of B.

Solution by G. W. GREENWOOD, M. A., McKendree College, Lebanon, Ill.

Denote the center of the fixed circle by O, and take Ox through A and B at a time when these points are collinear, A lying between O and B. Let A move counter clockwise. Then $x=(a+b)\cos\theta$, $y=(a-b)\sin\theta$.

$\therefore\ \dfrac{x^2}{(a+b)^2}+\dfrac{y^2}{(a-b)^2}=1$, where a, b are the radii of the fixed and moving circles, respectively.

Also solved by A. H. Holmes, A. S. Hawkesworth, D. B. Northrup, G. B. M. Zerr, and Proposer.

GROUP THEORY.

11. Proposed by DR. SAUL EPSTEEN, University of Colorado, Boulder.

Find the six-parameter continuous group which leaves invariant the surface of second order $x_1x_2-x_3x_4=0$.

Solution by the PROPOSER.

To every transformation of this group defined as below, correspond four different sets of values of the parameters a, b, ... In particular to the identical transformation corresponds $a=d=\pm1$, $\alpha=\delta=\pm1$, $b=c=\beta=\gamma=0$.

The group is

$$x'_1=\alpha(ax_1+bx_4)+\beta(ax_3+bx_2),$$
$$x'_2=\gamma(cx_1+dx_4)+\delta(cx_3+dx_2),$$
$$x'_3=\gamma(ax_1+bx_4)+\delta(ax_3+bx_2),$$
$$x'_4=\alpha(cx_1+dx_4)+\beta(cx_3+dx_2).$$